ECONOFLAME R6000 LMS
GAS FIRED
CONDENSING BOILERS

INSTALLATION,OPERATION & MAINTENANCE DOCUMENTATION

STOKVIS ENERGY SYSTEMS
96R WALTON ROAD
EAST MOLESEY
SURREY
KT8 0DL
TEL: 020 87833050 / 08707 707 747
FAX: 020 87833051 / 08707 707 767
E-MAIL: info@stokvisboilers.com
WEBSITE: www.stokvisboilers.com

DOC3070 R6000 BA

Contents

Contents		2
Safety	General regulations	3
	Application	3
	Norms and regulations	3
Construction	Layout of boiler	4
	Operating principle	4
Technical data		5
Extent of delivery	Standard boiler	7
	Accessories	7
Installation	Boiler transport	8
	Removing the casing	9
	Boiler installation	10
	Connecting the boiler	11
Commissioning	Water and hydraulic system	13
	Gas supply	14
	Condensate connection	14
	Flue and air intake connections	14
	Prepare boiler for first startup	15
	Combustion analysis	16
	Check water flow	17
	Check functionality of safety devices	18
	Gas tightness check	18
	Boiler shut down	18
	Commissioning protocol	19
Operating instructions	Controls	20
	Display / Programming	21
	Overview of main functions	22
Maintenance	Checklist	23
	Replacing the electrodes	23
	Cleaning the condensate receptacle	24
	Cleaning and refilling the syphon	24
	Inspection of combustion chamber	24
	Water pressure and quality	25
	Water flow rate	25
	Combustion analysis	25
	Gas pressure	25
	Gas tightness check	25
	Safety devices	25
	Maintenance protocol	26
Lockouts		27
Sensor values		30
Declaration of Conformity		31

Safety

General regulations
Application
Norms and regulations

General regulations
This documentation contains important information, which is a base for safe and reliable installation, commissioning and operation of the R6000 boiler. All activities described in this document may only be excecuted by authorized companies.

Changes to this document may be effected without prior notice. We accept no obligation to adapt previously delivered products to incorporate such changes.

Only original spare parts may be used when replacing components on the boiler, otherwise warranty will be void.

Application
The R6000 boiler may be used for heating and hot water production purposes only. The boiler should be connected to closed systems with a maximum temperature of 100ºC (high limit temperature), maximum setpoint temperature is 90ºC.

Norms and regulations
When installing and operating the boiler, all applicable norms (european and local) should be fulfilled:

- Local building regulations for installing combustion air and flue gas systems;
- Regulation for connecting the boiler to the electrical appliance;
- Regulations for connecting the boiler to the local gas network;
- Norms and regulations according to safety equipment for heating systems;
- Any additional local laws/regulations with regard to installing and operating heating systems.

The R6000 boiler is CE approved and applies to the following European standards:

– 92 / 42 / EEC
Boiler efficiency directive
– 2009 / 142 / EEC
Gas appliance directive
– 73 / 23 / EEC
Low voltage directive
– 2004 / 108 / EEC
EMC directive
– EN 656
Gas-fired central heating boilers – Type B boilers of nominal heat input exceeding 70 kW but not exceeding 300 kW
– EN 15420
Gas-fired central heating boilers - Type C boilers of nominal heat input exceeding 70 kW, but not exceeding 1000 kW
– EN 15417
Gas-fired central heating boilers - Specific requirements for condensing boilers with a nominal heat input greater than 70 kW but not exceeding 1000 kW
– EN 13836
Gas fired central heating boilers - Type B boilers of nominal heat input exceeding 300 kW, but not exceeding 1000 kW
– EN 15502-1
Gas-fired central heating boilers - Part 1: General requirements and tests
– EN 55014-1 (2000)
Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
– EN 55014-2 (1997)
Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard
– EN 61000-3-2 (2000)
Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current 16 A per phase)
– EN 61000-3-3 (2001)
Electromagnetic compatibility (EMC) - Part 3-3: Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current 16 A per phase and not subject to conditional connection
– EN 60335-1 (2002)
Household and similar electrical appliances - Safety - Part 1: General requirements
– EN 60335-2-102 (2006)
Household an similar electrical appliances: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections

Additional national standards

Germany:
– RAL - UZ 61 / DIN 4702-8

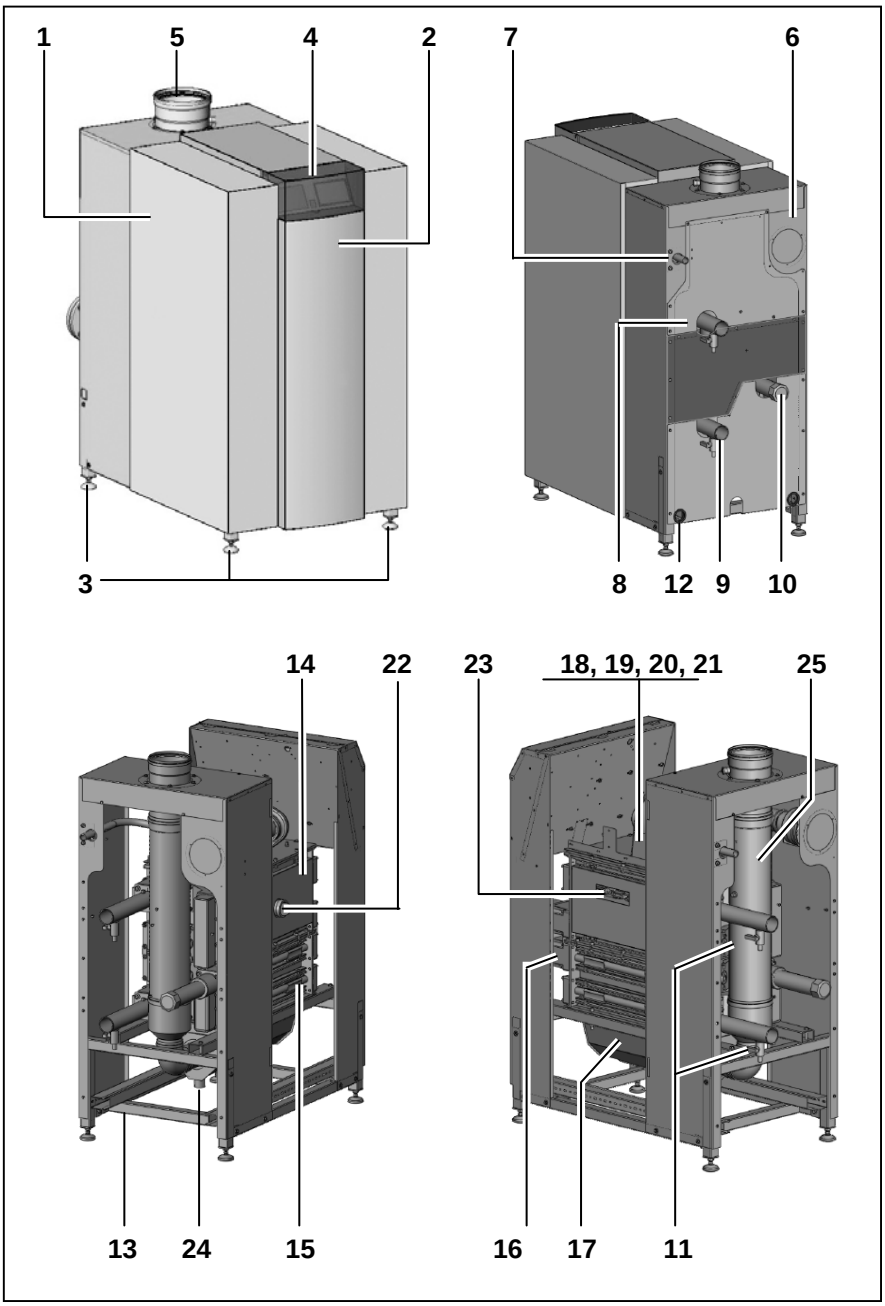
Switzerland:
– SVGW
– EKAS-Form. 1942: Flüssiggas-Richtlinie Teil 2
– Vorschriften der kantonalen Instanzen (z.B. Feuerpoilizeivorschriften)

Netherlands:
– GASKEUR BASIS
– GASKEUR SV
– GASKEUR HR107

Belgium:
– HR TOP

Construction

Layout of boiler
Operating principle



Layout of boiler
The R6000 boiler consists of the following main components:

1 Casing
2 Front panel
3 Adjustable feet
4 Control panel (below cover)
5 Flue gas connection
6 Air intake connection (under casing)
7 Gas connection
8 Flow water connection
9 Return water connection
10 2nd (hot) return water connection (for split system use)
11 Filling/draining valve
12 Electrical input connections
13 Frame
14 Burner/1st heat exchanger assembly
15 2nd/3rd heat exchanger assembly
16 Water headers
17 Condensate receptacle
18 Whirlwind gas/air mixing system
19 Fan
20 Gas valve
21 Gas pressure switch
22 Inspection opening
23 Ignition and ionisation electrodes
24 Syphon
25 Removable flue gas adapter

Operating principle
The R6000 is a fully modulating boiler. The control unit of the boiler adapts the modulation ratio automatically to the heat demand requested by the system. This is done by controlling the speed of the fan. As a result, the Whirlwind mixing system will adapt the gas ratio to the chosen fan speed, in order to maintain the best possible combustion figures and therewith the best efficiency. The flue gases created by the combustion are transported downwards through the boiler and leave at the back side into the chimney connection.

The return water from the system enters the boiler in the lower section, where is the lowest flue gas temperature in the boiler. In this section condensation takes place. The water is being transported upwards through the boiler, in order to leave the boiler at the top (burner) section. The cross flow working principle (water up, flue gas down) ensures the most efficient combustion results.

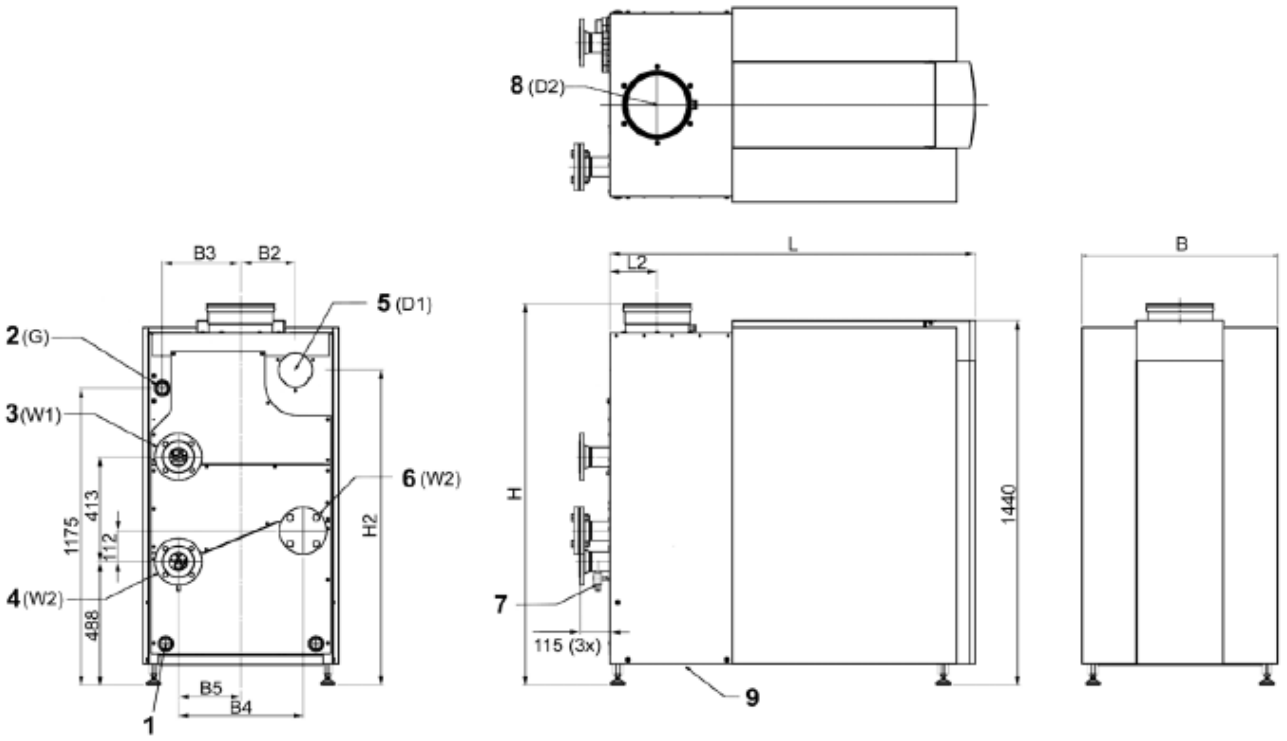
The LMS14 control unit can control the boiler operation based on:
- Boiler control (stand alone operation);
- Weather compensated operation (with optional outdoor sensor);
- With 0-10V external influence (temperature or capacity) from a building management system.

Technical data

		R6142	R6190	R6237	R6285	R6380	R6475	R6539
Nominal heat output at 80/60ºC max/min*	kW	142.1/23.3	190.1/39.5	237.2/39.5	285.2/39.5	380.2/76.6	475.3/76.6	539.0/76.6
Nominal heat output at 75/60ºC max/min*	kW	142.2/23.5	190.3/39.5	237.4/39.5	285.5/39.5	380.6/76.6	475.8/76.6	539.6/76.6
Nominal heat output at 40/30ºC max/min*	kW	150.7/26.7	201.6/45.2	251.4/45.1	302.3/45.2	403.1/87.7	503.9/87.7	571.5/87.7
Nominal heat input Hi max/min*	kW	145.0/24.5	194.0/41.5	242.0/41.5	291.0/41.5	388.0/80.5	485.0/80.5	550.0/80.5
Efficiency at 80/60ºC	%	98.0						
Efficiency at 40/30ºC	%	103.9						
Annual efficiency (NNG 75/60ºC)	%	106.8						
Annual efficiency (NNG 40/30ºC)	%	110.4						
Standstill losses (T_{water} = 70ºC)	%	0.21	0.18	0.17	0.16	0.15	0.14	0.13
Max. condensate flow	l/h	11	15	19	22	30	37	42
Gas consumption H-gas max/min (10,9 kWh/m^3)	m^3/h	13.3/2.3	17.8/3.8	22.2/3.8	26.7/3.8	35.6/7.4	44.5/7.4	50.5/7.4
Gas consumption L-gas max/min (8,34 kWh/m^3)	m^3/h	17.4/2.9	23.2/5.0	29.0/5.0	34.9/5.0	46.5/9.7	58.2/9.7	66.0/9.7
Gas consumption LL-gas max/min (8,34 kWh/m^3)	m^3/h	17.4/2.9	23.2/5.8	29.0/5.8	34.9/5.8	46.5/11.2	58.2/11.2	66.0/11.2
Gas consumption LPG. max/min (12,8 kWh/kg)	kg/h	11.3/1.9	15.2/3.2	18.9/3.2	22.7/3.2	30.3/6.3	37.9/6.3	43.0/6.3
Gas pressure H-gas	mbar	20						
Gas pressure L/LL-gas	mbar	25						
Gas pressure LPG	mbar	30/50						
Maximum gas pressure	mbar	100						
Flue gas temperature at 80/60ºC max/min	ºC	78/61						
Flue gas temperature at 40/30ºC max/min	ºC	56/30						
Flue gas quantity max/min*	m^3/h	238/40	318/69	397/69	477/69	636/134	795/134	901/134
CO_2 level natural gas H/E/L/LL max/min	%	10.2/9.4						
CO_2 level liguid gas P max/min	%	11.9/10.0						
NOx level max/min	mg/kWh	35/15						
CO level max/min	mg/kWh	14/8						
Max. permissible flue resistance max/min	Pa	160/10	160/10	200/10	200/10	200/10	250/10	250/10
Water volume	l	27	31	35	61	68	75	82
Water pressure max/min	bar	8/1						
Max. water temperature (High limit thermostat)	ºC	100						
Maximum temperature setpoint	ºC	90						
Nominal water flow at dT=20K	m^3/h	6.1	8.1	10.2	12.2	16.3	20.4	23.1
Hydraulic resistance at nominal water flow	kPa	10	18	28	15	27	42	55
Electrical connection	V	230/400						
Frequency	Hz	50						
Mains connection fuse	A	16						
IP class	-	IP20						
Power consumption boiler max/min (excl. pump)	W	158/43	200/35	230/35	260/35	470/61	650/61	770/61
Power consumption 3-step pump (optional)	W	170/90	190/120	380/210	380/210	530/300	720/380	1150/600
Power consumption speed controlled pump (opt)	W	180/10	180/10	435/25	435/25	450/25	800/35	800/35
Power consumption bypass pump (optional)	W	55/35	85/65	170/90	170/90	190/120	460/225	470/280
Weight (empty)	kg	295	345	400	465	535	590	650
Noise level at 1 meter distance	dB(A)	59						
Ionisation current minimum	µA	6						
PH value condensate	-	3.2						
CE certification code	-	CE-0063BS3840						
Water connections	-	R2"			DN65 PN16			
Gas connection	-	R3/4"	R1"	R1"	R1"	R1.1/2"	R1.1/2"	R1.1/2"
Flue gas connection	mm	150	150	200	200	250	250	250
Air intake connection (for room sealed use)	mm	130	150	150	150	200	200	200
Condensate connection	mm	40	40	40	40	40	40	40

* min load on gasses H/L/LPG. For type R6237-R6539 on gasses LL-Gas min value is 15% higher.

Technical data



Dimension		R6142	R6190	R6237	R6285	R6380	R6475	R6539
L	mm	1105	1260	1470	1220	1435	1585	1735
L2	mm	127.5	127.5	137.5	137.5	187.5	187.5	187.5
H	mm	1480	1480	1500	1500	1500	1500	1500
H2	mm	1120	1130	1130	1150	1245	1245	1245
B	mm	670	670	670	770	770	770	770
B2	mm	225	235	235	235	215	215	215
B3	mm	260	260	260	310	310	310	310
B4	mm	260	260	260	490	490	490	490
B5	mm	130	130	130	245	245	245	245
D1	mm (Diam.)	130	150	150	150	200	200	200
D2	mm (Diam.)	150	150	200	200	250	250	250
W1	R" / DN	R2"	R2"	R2"	DN65 PN16			
W2	R" / DN	R2"	R2"	R2"	DN65 PN16			
G	R	R 3/4"	R 1"	R 1"	R 1"	R 1 1/2"		

1 Electrical connections
2 Gas supply
3 Water supply
4 Water return (Cold)
5 Air Intake (under casing)
6 Water 2nd return (Hot)
7 Boiler water drain valve 1/2"
8 Flue gas Outlet
9 Condensate drain
flexible hose 25mm diam.

Extent of delivery

Standard boiler
Accessories

Standard boiler
A boiler delivery package contains the following components:

Component	Pcs.	Package
Boiler fully assembled and tested	1	Mounted on wooden blocks with wooden border, sealed in PE foil
Adjustable feet	4	Mounted on frame of the boiler
Syphon for condensate connection	1	Cardboard box on top of heatexchanger (under casing)
Conversion kit for natural gas L and propane incl. instruction	1	Cardboard box on top of heatexchanger (under casing)
Operation and Installation manual	1	Map attached to back panel of the boiler
Spare parts list	1	Map attached to back panel of the boiler
Wiring diagram	1	Map attached to back panel of the boiler

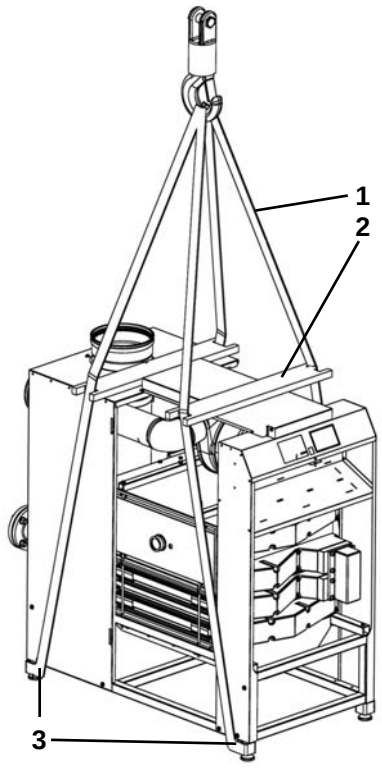
Accessories
Additional to the boiler, the following accessories can be ordered:

- Standard 3-step pump incl. connection kit;
- Speed controlled pump incl. connection kit;
- Safety valve, manometer and deaerator (3,4,5 or 6 bar) incl. connection kit;
- 2x max. water pressure switch and 1 external high limit thermostat incl. connection kit;
- Gas filter incl. connection kit;
- Max. gas pressure switch;
- External high limit thermostat incl. connection kit;
- Gas valve leakage tester (not possible for R6142);
- Controlled bypass (incl. pump) incl. connection kit;
- Plate heat exchanger (dT=10K/15K or dT=20K) incl. connection kit;
- Low velocity header, suitable for dT=10K/15K and dT=20K incl. connection kit;
- Duo header for connecting 2 boilers in cascade (excl. connection kit);
- Extension module AVS75 for heating zone control or external gas valve and/or room fan control.
  For each boiler a maximum of 3 AVS75 modules (2x heating zone, 1x ext. gas valve / room fan) can be integrated in the boiler;
- Additional RVS63 heating zone controller, when controlling more than 2 zones (incl. wall hung box, all necessary sensors and sockets and connection material for bus communication).

The above accessories are specially designed for the R6000 boiler and therewith easy to install (plug and play). By choosing a combination of the kits mentioned above, you can create your own complete system solution. Ask your supplier for more detailed information.

Installation

Boiler transport



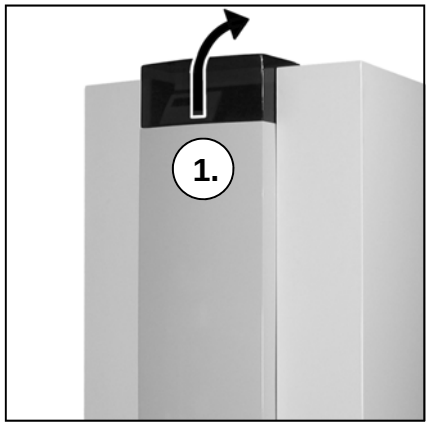
1 Hoisting belt (4x)
2 Wooden retaining beam (2x)
3 Hoisting belt position (4x)

Boiler transport
The R6000 boiler will be supplied as a complete unit being fully assembled and pre-tested. The maximum width is 670mm for models R6142-R6237 and 770mm for models R6285-R6539, which makes it possible to transport all models through a normal door in one piece. The boiler can be transported with a pallet truck, entering either from the front or from the side.
Whenever necessary, the boiler can be dismantled into smaller parts for easier transport inside the building. The table below shows the main dismantled parts with their weight and dimensions.

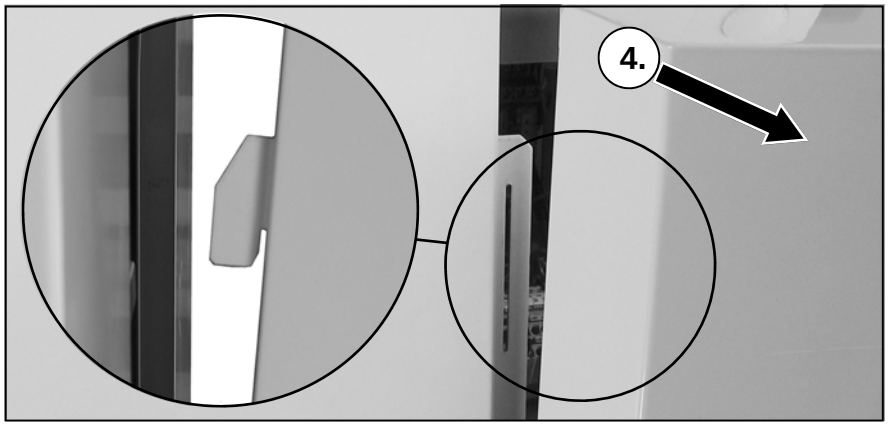
When the boiler has to be transported with a crane, it is necessary to remove the casing before connecting the boiler to the crane. Always connect the crane to the frame of the boiler by using straps.

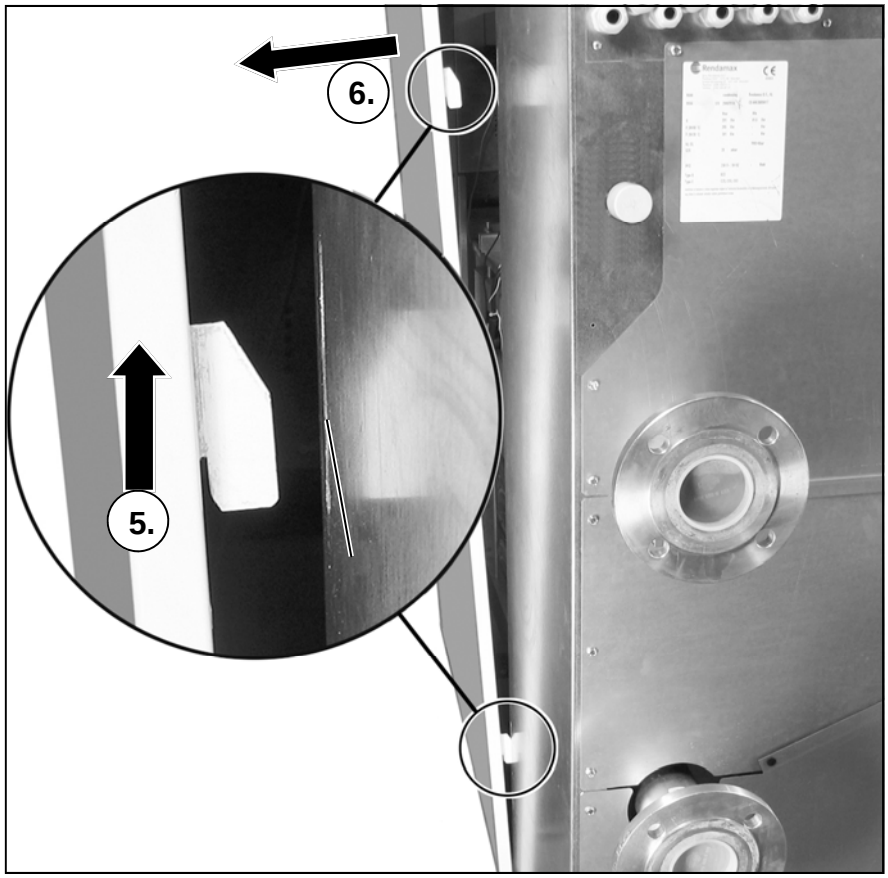
Component		R6142	R6190	R6237	R6285	R6380	R6475	R6539
Burner/1st heat exchanger assembly	Weight [kg]	86	100	112	135	158	181	198
	Length [mm]	735	885	1035	735	885	1035	1185
	Width [mm]	400	400	400	680	680	680	680
	Height [mm]	321	321	321	321	321	321	321
2nd/3rd heat exchanger assembly	Weight [kg]	90	103	116	150	170	198	219
	Length [mm]	735	885	1035	735	885	1035	1185
	Width [mm]	400	400	400	680	680	680	680
	Height [mm]	244	244	244	244	244	244	244
Condensate receptacle	Weight [kg]	7	9	10	11	12	13	15
	Length [mm]	589	739	889	589	739	889	1039
	Width [mm]	385	385	385	665	665	665	665
	Height [mm]	225	225	225	225	225	225	225
Frame	Weight [kg]	15	16	17	17	18	19	21
	Length [mm]	990	1140	1350	1100	1320	1470	1620
	Width [mm]	624	624	624	724	724	724	724
	Height [mm]	335	335	335	335	335	335	335
Front U-frame with electronic board	Weight [kg]	11	11	11	12	12	12	12
	Length [mm]	628	628	628	728	728	728	728
	Width [mm]	1304	1304	1304	1304	1304	1304	1304
	Height [mm]	202	202	202	202	202	202	202

Removing the casing



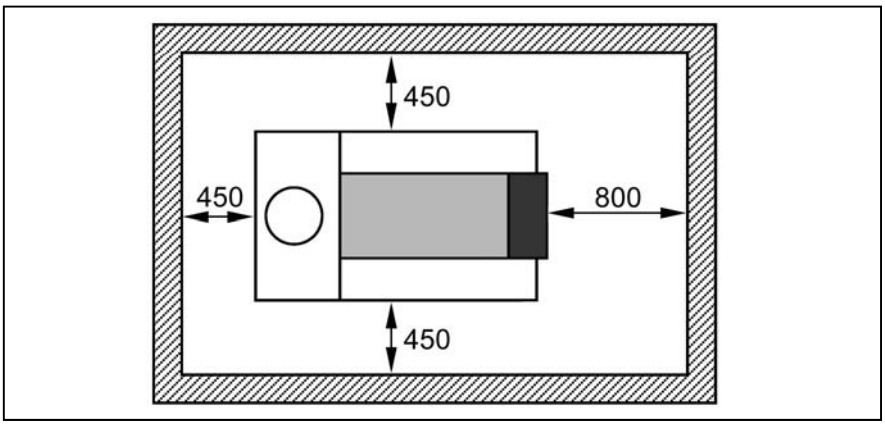
Boiler transport
Remove the casing before transporting the boiler, in order to avoid damage to the casing parts during transportation. Removing the casing is done as follows:

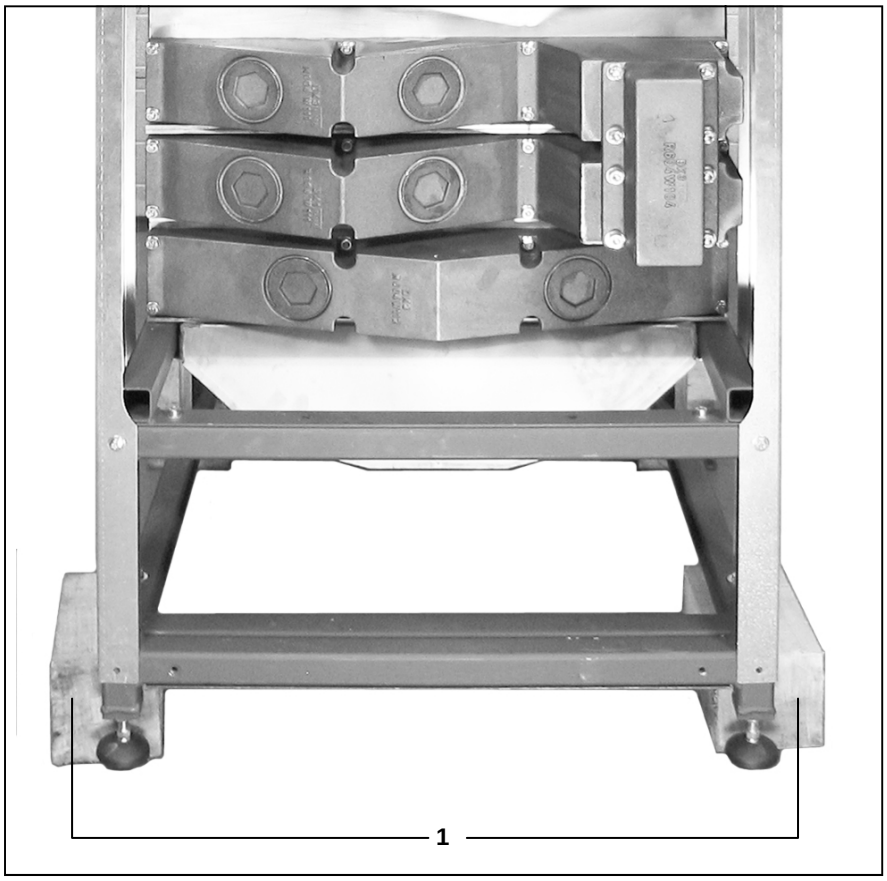




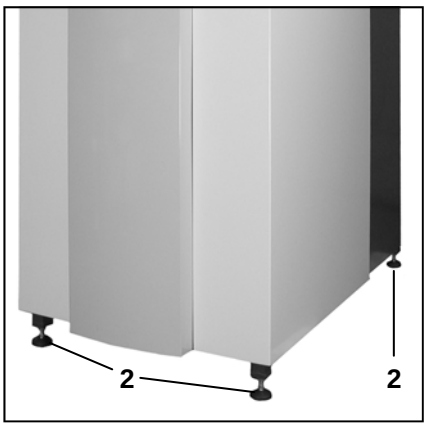
Installation

Boiler installation

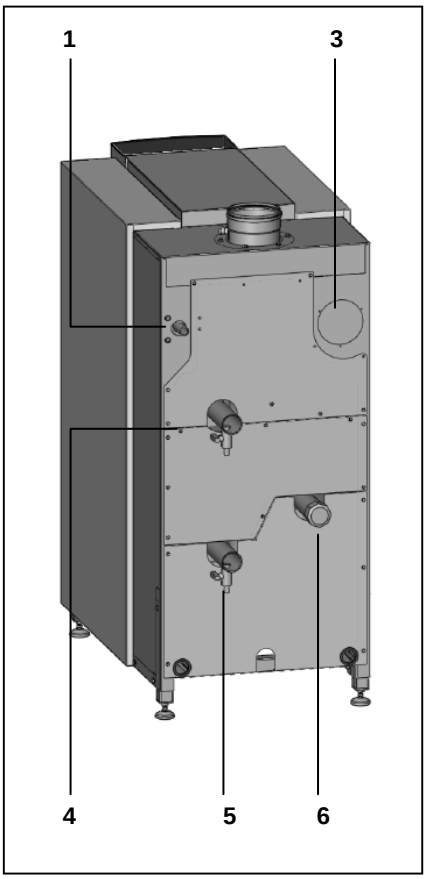




Boiler installation
The boiler should be positioned in a frost-proof boiler room. If the boiler room is on the roof, the boiler itself may never be the highest point of the installation.
When positioning the boiler, please note the recommended minimum clearance in the picture. When the boiler is positioned with less free space, maintenance activities will be more difficult.
Once the boiler is in the correct position, the wooden blocks (1) should be removed and the adjustable feet (2) (with vibration absorption dampers) should be adjusted to the right height.
Water and gas connections should be done after mounting the feet, as they affect the exact height of all connections.



Connecting the boiler



Connecting the boiler
This chapter will explain how to make all connections to the boiler with regard to:

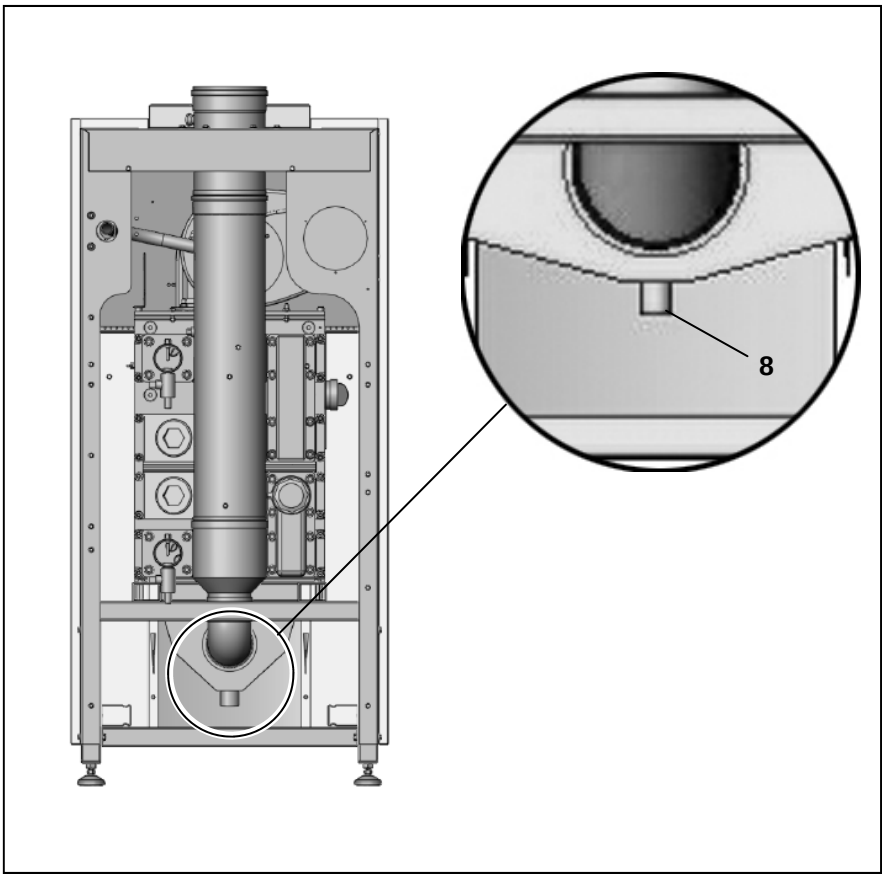
- Hydraulic connections
- Condensate drain connection
- Gas connection
- Flue gas connection
- Air intake connection (under casing)
- Electrical connection

The boiler should always be connected in such a way, that the system applies to all relevant standards and regulations (European, national and local). It's the responsibility of the installer to ensure that all standards and regulations are respected.

Hydraulic connections
The boiler should always be connected in such a way, that water flow through the boiler can be ensured at all times. Connect the flow (4) and return (5) connection of the system tension free to the boiler connections. If the boiler is used in a system with two return circuits, the common return becomes the low temperature return, the 2nd return connection (6) is the high temperature return (remove cap/flange before connecting).

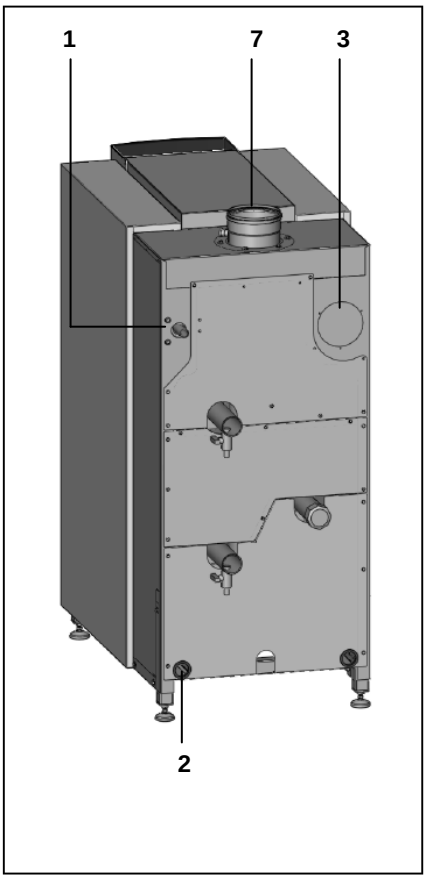
The (optional) accessory kit with safety valve, manometer and deaerator should be mounted on the flow connection (4) of the boiler, before connecting to the system.

The (optional) pump kit should be mounted directly to the return connection (5) of the boiler, before connecting to the system.



Condensate connection (8)
After filling with water, the syphon (included in delivery) should be installed to the connection at the bottom of the condensate receptacle. Lead the hose under the frame at the back of the boiler and connect it to the draining system in the boiler room. The connection to the draining system should always be done with an open connection, in order to avoid a flooding of the boiler in case of a blocked drain.

Connecting the boiler



Gas connection (1)
The gas connection must be made by an authorized installer in accordance with the applicable national and local standards and regulations.

Connect the gas line from the system tension free to the gas connection (1) of the boiler. A gas cock should be mounted directly behind the boiler.

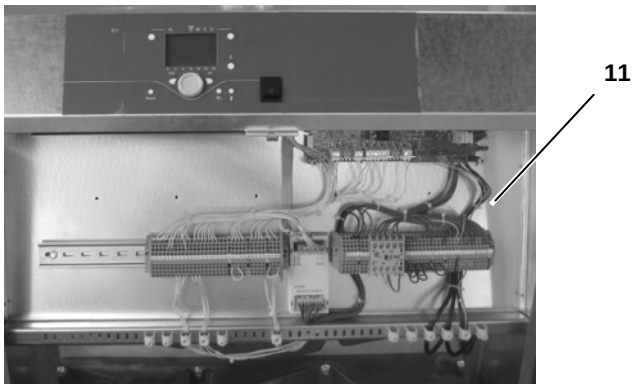
A gas filter can be mounted directly on the gas connection of the boiler.

Flue gas connection (7)
Regulations for the construction of flue gas systems are very different for each country. It should be ensured that all national regulations with regard to flue gas systems are respected.

Connect the flue gas system to the flue gas connection (7) of the boiler, use fluegas systems with seamless connections only. It's not necessary to make a separate condensate drain for the flue gas system, as the condensate will be drained via the syphon of the boiler. Please note the following issues:

- It's recommended to use stainless steel or PPS fluegas systems
- The diameter of the flue gas system must be chosen by calculation according to the national regulations
- Construct the flue gas system as short as possible (for maximum length see planner documentation)
- Construct horizonal ways with a minimum angle of 3º

Air intake connection (3)
The air intake can be connected in case of room sealed installation. The cover (3) must be disassembled in order to connect the air intake piping to the connector inside the boiler. The diameter should be calculated according to the national regulations, together with the flue gas system. The total resistance of both systems should never overcome the maximum permissible resistance of the fan inside the boiler (see also chapter: Technical data).



Electrical connection
The electrical connection must be madde by an authorized installer in accordance with the applicable national and local standards and regulations.

For the power supply it's necessary to use a mains isolator switch with a contact opening of at least 3 mm within the boiler room. This switch can be used to switch off the power supply for maintenance purposes.

All cables should be lead through the cable gland (2) from the back of the boiler boiler into the electro panel (11).

Connect all wires to the terminals according to the wiring diagram of the boiler (enclosed in map attached to back panel of the boiler).

Commissioning

Water and hydraulic system

Commissioning of the boiler should be carried out by authorized personnel only. Failure to respect this condition makes the guarantee void. A protocol of the commissioning should be filled out (see end of this chapter for example of commissioning protocol).

This chapter explains the commissioning of the boiler with the standard boiler controller. When an additional system controller is installed, please refer to its manual for commissioning the controller.

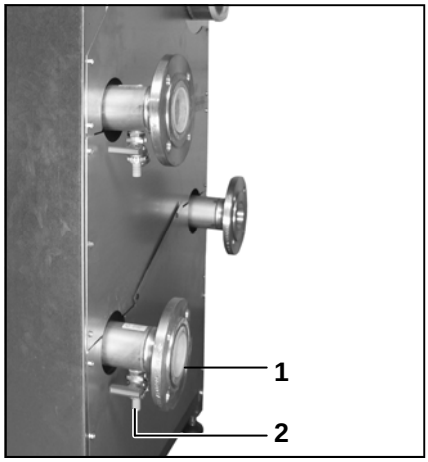
Boiler output [kW]	Max. sum of alkaline earths [mol/m^3]	Max. total hardness [dºH]
50 - 200	2.0	11.2
200 - 600	1.5	8.4

Water quality
The system should be filled with water with a PH value between 8,0 and 9,5. The chloride value of the water should not exceed 50 mg/l. Entry of oxygen by diffusion should be prevented at all times. Damage to the heat exchanger because of oxygen diffusion will not be taken under warranty.

In installations with higher water volumes, it's necessary to respect the maximum filling and additional volumes with corresponding hardness values as stated in the german VDI2035 standard. In the table you can find the nominal values for filling and additional water for the R6000 according to the the VDI2035.

Concentrate $Ca(HCO_3)_2$		Capacity of installation Q (kW)						
		150	200	250	300	400	500	600
mol/m^3	dºH	Maximum water (re)fill volume V_{max} [m^3]						
≤0.5	≤2.8	-	-	-	-	-	-	-
1.0	5.6	-	-	-	-	-	-	-
1.5	8.4	3	4	5	6	8	10	12
2.0	11.2	3	4	5	6	6.3	7.8	9.4
2.5	14.0	1.9	2.5	3.1	3.8	5.0	6.3	7.5
≥3.0	≥16.8	1.6	2.1	2.6	3.1	4.2	5.2	6.3

The table at the left gives an indication of the relation between the water quality and the maximum water filling volume during the lifetime of the boiler. Consult the original text of the VDI2035 for more detailed information.



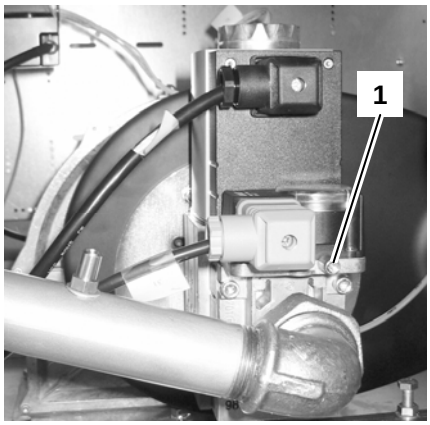
Water pressure
Open the valves to the system. Check the water pressure in the system. If the water pressure is too low (see table below), increase the pressure up to at least the minimum required water pressure in the table.
Filling can be done via the fill and drain valve (2) on the return connection (1) of the boiler.

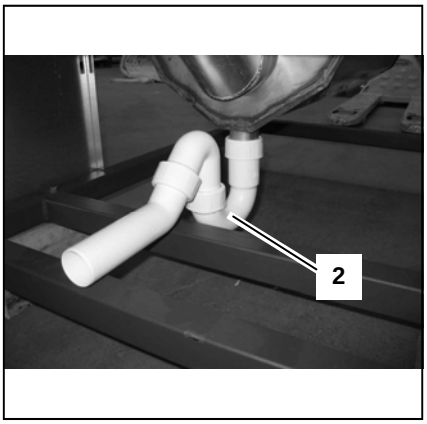
Minimum operating pressure [bar]	Flow temperature [ºC]
> 1.5	90
> 1.0	80

Hydraulic system
Check if the boiler is hydraulically connected to the system in such way, that water flow can be secured at all times during burner operation. The water flow is supervised by the water flow switch in the boiler and a lack of flow will lead to a direct burner stop and lockout of the boiler.

Commissioning

Gas supply
Condensate connection
Flue and air intake connections





Gas supply
Check the gas supply connection to the boiler for tightness. If any leakage is found, reseal the leakage before starting the boiler!

Remove any air between the gas valve and the gas line. This can be done at the test point (1) at the gas pressure switch. Don't forget to close the test point afterwards!

Check the gas type and values with the local gas company, in order to know for which gas type the boiler should be commissioned.
Consult the conversion kit instruction if the boiler is to be installed with natural gas L or LPG.

Condensate connection
Remove the syphon (2) from the condensate connection. Fill it with water and place it back in the original position. Make sure the syphon is filled before starting the boiler, in order to prevent flue gases discharging through the condensate connection!

Flue and air intake connections
Check whether the flue and air intake systems are made according to the national and local regulations. Installations which don't comply with the regulations, are not allowed to be commissioned.

Make sure that all connections are free.

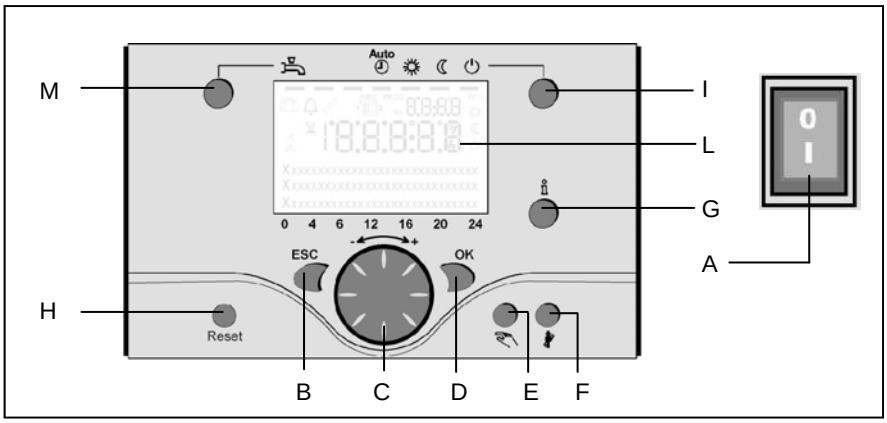
The size of flue gas and air intake connections may not be reduced.

Commissioning

Prepare boiler for first startup

Legend:

A On/off switch
B Return (ESC)
C Room temperature control
D Confirmation (OK)
E Manual mode
F Chimney sweeper mode
G Info mode
H Reset button
I Operation mode heating zone(s)
L Display
M Operation mode DHW



Preparation for first startup

- Open the gas supply;
- Enable the power supply to the boiler;
- Switch on the boiler with the on/off switch (1);
- Make sure the boiler is in standby mode (⏻);
- Check the pump operation: make sure the pump runs in the right direction;
- Release all air from the pump motor.

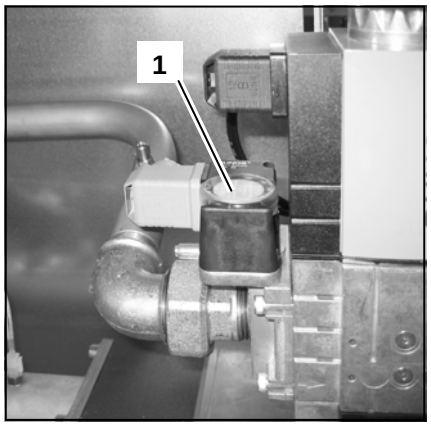
It‘s recommended to put the boiler on 50% load after the first startup, as this is the best starting point to do a proper combustion analysis. This can be done with the following procedure:

- Push button I >3 Sec, the boiler goes into controller Stop mode.
- Push the Info button (G), the actual boiler load (%) appears in the display;
- Choose "set up" (confirm with OK button), now the boiler load can be changed by rotating the wheel (C) and confirming the 50% setting with the OK button.

After checking the combustion values (see next page), the controller Stop mode can be stopped by pushing the control mode button (I) >3 Sec.

Commissioning

Combustion analysis

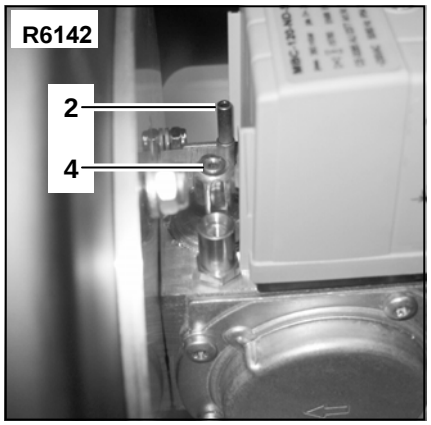


Combustion check at full load
Start the boiler in controller stop mode and go to 50% load. Now the boiler operates at 50% load. Allow the boiler to stabilise the combustion for 3 minutes. Then increase the boiler load step by step up to 100%. Check the gas pressure on the inlet of the gas valve while increasing the boiler load: the gas pressure should never go below the minimum required value ➔ see technical data. Set the minimum gas pressure switch (1) at 75% of the required gas pressure.

Check the combustion settings via the test point in the chimney connection(3). If necessary, correct the settings with the flat adjustment screw on the outlet of the gas valve (2).

Combustion settings for natural gas G20 / G25		
		R6142-R6539
$CO_{2,\ max}$	%	10.2 ± 0.2
CO_{max}	ppm	< 30

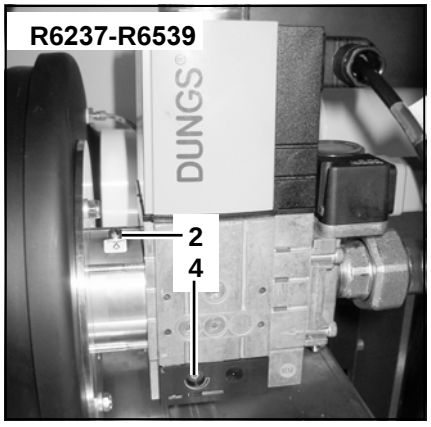
Combustion settings for LPG G31		
Convert boiler before operation (see coversion kit instruction)		
		R6142-R6539
$CO_{2,\ max}$	%	11.9 ± 0.2
CO_{max}	ppm	< 30



Combustion check at minimum load
Switch the boiler to minimum load (0%). Check the combustion settings the same way as described for full load. If necessary, correct the settings with the allen key adjustment screw on either side of the gas valve (4).

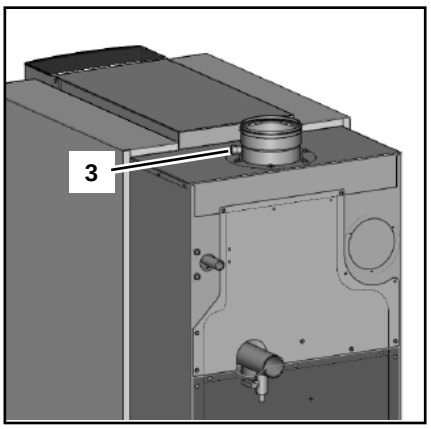
Combustion settings for natural gas G20 / G25		
		R6142-R6539
$CO_{2,\ min}$	%	9.4 ± 0.2
CO_{min}	ppm	< 30

Combustion settings for LPG G31		
Convert boiler before operation (see coversion kit instruction)		
		R6142-R6539
$CO_{2,\ min}$	%	10.0 ± 0.2
CO_{min}	ppm	< 30



Combustion check at 50% load
An additional reference check of combustion values at 50% load is recommended in order to check if the gas valve is set in such way, that the modulating behaviour is normal. The CO_2 value should be in between the settings of full load and minumum load. CO value should be equal to full load and minimum load values.

Make sure that the boiler is set to automatic operation and controller stop mode is disabled after the combustion test is finished.



Check water flow

Check water flow
The water flow through the boiler can be checked with two different methods shown below.

∆T measurement
Check the temperature difference over the boiler (∆T flow-return) when the boiler is running on 100% load. The nominal ∆T is 20K and must be at least between 15K and 25K for secure boiler operation. An indication of the actual flow rate can be found with the following calculation (see table below for nominal data):

$q_{actual} = (\Delta T_{nominal} / \Delta T_{measured}) * q_{nominal}$ [m^3/h]

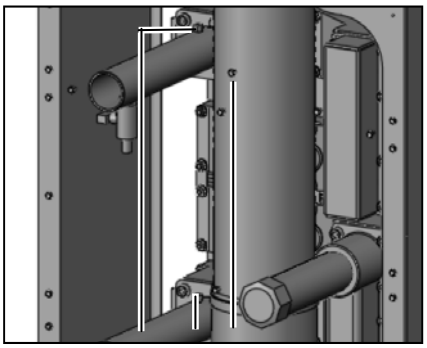
∆p measurement
Check the pressure difference over the boiler (∆p flow-return) when the boiler pump is running (burner on is not required). The nominal ∆p for each boiler type can be found in the table below, actual ∆p must be within:
$0.35*\Delta p_{nom} \leq \Delta P \leq 1.75*\Delta p_{nom}$. An indication of the actual flow rate can be found with the following calculation (see table below for nominal data):

$q_{actual} = \sqrt{(\Delta p_{measured} / \Delta p_{nominal})} * q_{nominal}$ [m^3/h]

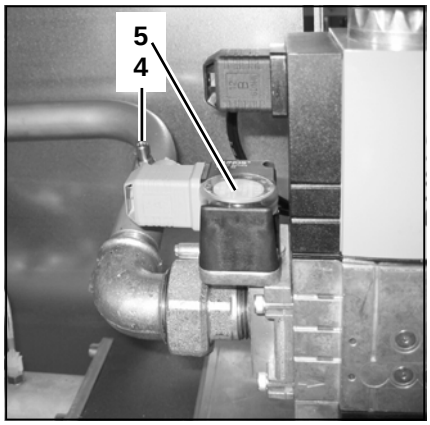
Water flow data								
		R6142	R6190	R6237	R6285	R6380	R6475	R6539
Nominal flow rate	[m^3/h]	6.1	8.1	10.2	12.2	16.3	20.4	23.1
∆T at nominal flow rate	[ºC]	20						
∆p at nominal flow rate	[kPa]	10	18	28	15	27	42	55

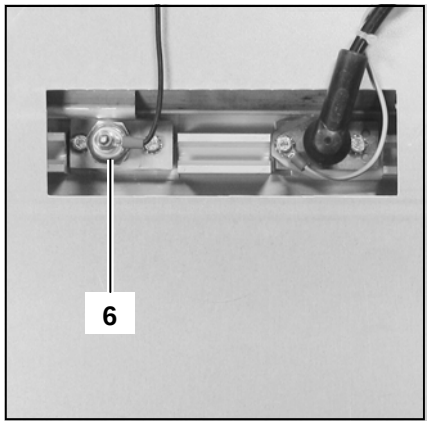
Commissioning

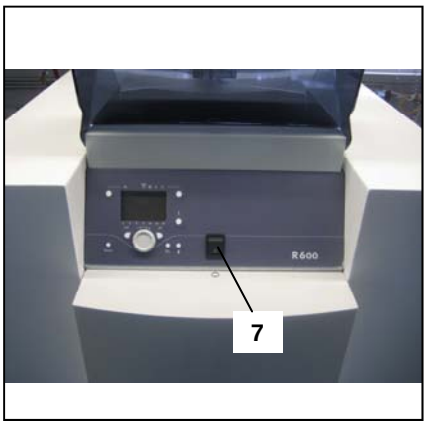
Check functionality of safety devices
Gas tightness check
Boiler shut down



1 2 3







Check functionality of safety devices
All safety devices have to be checked on good functioning. Safety devices on a standard boiler are a water flow temperature sensor, fluegas temperature sensor, water flow switch minumum gas pressure switch and ionisation electrode. These devices can be checked as described below.

Flow temperature sensor (1)
Disconnect the plug from the sensor while the boiler is switched on. This should result in a lockout no. 20.
The lockout should disappear as soon as the plug is placed back in position, the boiler will restart.

Return temperature sensor (2)
Disconnect the plug from the sensor while the boiler is switched on. This should result in a lockout no. 40.
The lockout should disappear as soon as the plug is placed back in position, the boiler will restart.

Flue gas temperature sensor (3)
Disconnect the plug from the sensor while the boiler is switched on. This should result in a lockout no. 28.
The lockout should disappear as soon as the plug is placed back in position, the boiler will restart.
.

Minimum gas pressure switch (5)
Close the gas cock when the boiler is in standby position (⏻). Open the test point on the gas line (4) while measuring the gas pressure on the test point of the gas pressure switch (5).
The boiler will go in lockout no. 2 when the switch off setting is achieved. Close both test points and open the gas cock.

Ionisation electrode (6)
Remove electrical connection from the ionisation electrode while the boiler is running, the boiler will go in lockout no. 128. The boiler will try to restart. With the electrical connection removed, the restart will result in lockout no. 133. When the connection is already mounted, the restart will be successful.

Measuring the ionisation current can be done by mounting a multi-meter (set to µA) in between the ionisation electrode and its electrical connection. The ionisation current should always be above 1.2 µA, in normal conditions it will be 6 µA and above.

Gas tightness check
Check the gas tightness of all sealed connections with an approved soap or electronic gas analyzer, for example:
- Test points
- Bolt connections
- Gaskets of mixing system, etc.

Boiler shut down
When the boiler will not be used for longer periods, shut down the boiler by following procedure:
- Switch the boiler in standby operation (⏻)
- Switch off the boiler with the on/off switch (7)
- Disable power supply to the boiler by deactivating the mains isolator switch in the boiler room
- Close the gas supply to the boiler.

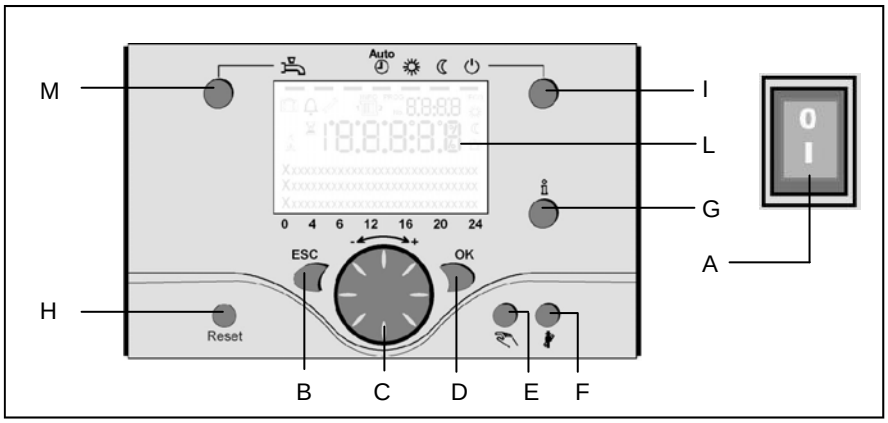
Commissioning protocol

Commissioning Protocol R6000				
Project				
Boiler type		Project		
Serial number		Address		
Year		City		
Nominal load (Hi)	[kW]	Date		
Nominal output (Hi)	[kW]	Engineer		
System				
Water pressure	[bar]	Installation:	Roof top	☐
Water pH (by others)	[-]		Ground floor	☐
Water hardness (by others)	[dºH]		Basement	☐
Water chloride (by others)	[mg/l]		Other:	☐
Water ΔT full load	[ºC]	Hydraulics:	Low velocity header	☐
Water Δp_{boiler}	[kPa]		Plated heat exchanger	☐
Water flow	[m^3/h]		Bypass boiler	☐
Pump setting	[-]		Other:	☐
Safety devices				
High limit setting	[ºC]	Water flow sensor checked		☐
Temp. limiter setting	[ºC]	Fluegas sensor checked		☐
Min. gas pressure switch setting	[mbar]	Water flow switch checked		☐
Ignition time burner	[sec]			

Combustion analysis			
	100% load	**50% load**	**Min. load**
Gas consumption	[m^3/h]	[m^3/h]	[m^3/h]
Gas pressure	[mbar]	[mbar]	[mbar]
CO_2	[%]	[%]	[%]
O_2	[%]	[%]	[%]
CO	[ppm]	[ppm]	[ppm]
NOx (optional)	[ppm]	[ppm]	[ppm]
$T_{atmospheric}$	[ºC]	[ºC]	[ºC]
$T_{fluegas}$	[ºC]	[ºC]	[ºC]
$T_{water, flow}$	[ºC]	[ºC]	[ºC]
$T_{water, return}$	[ºC]	[ºC]	[ºC]
Ionisation current	[µA]	[µA]	[µA]
p_{fan}	[mbar]	[mbar]	[mbar]
$p_{top\ panel}$	[mbar]	[mbar]	[mbar]
$p_{combustion\ chamber}$	[mbar]	[mbar]	[mbar]

Remarks

Controls



Legend:
A On/off switch
B Return (ESC)
C Room temperature control
D Confirmation (OK)
E Manual mode
F Chimney sweeper mode
G Info mode
H Reset button
I Operation mode heating zone(s)
L Display
M Operation mode DHW

Operation mode DHW (M)
For switching on the DHW operation (indication in display below DHW symbol)

Operation mode heating zone(s) (I)
For setting 4 different heating modes:
Auto (clock): Automatic operation by time programm
Comfort (sun): 24/7 heating in comfort mode
Reduction (moon): 24/7 heating in reduced mode
Standby: heating off, frost protection activated.

Display (L)

Info mode (G)
Display possibility of following info without influence on boiler control: temperatures, operation mode Heating / DHW, error code.

Room temperature control (C)
- for changing room comfort temperature
- for changing settings when programming.

Confirmation (OK) (D)
Return (ESC) (B)
These buttons are used for programming in combination with the wheel.

By pressing the ESC button it‘s possible to go back one level, changed values are not taken over by the controller.

By pressing the OK button it‘s possible to arrive in the next level or confirm changed values.

Manual mode (E)
This button is used for switching the boiler into manual mode. In manual mode all pumps will run and the mixing valves are no longer controlled, the burner setpoint is 60°C (indicated by spanner symbol).

On/off switch (A)
Position 0:
Boiler and connected electrical components are not powered. Frost protection is not secured.

Position I:
The boiler and connected electrical components are powered and standby for operation.

Deaeration mode (E)
By pressing the manual mode button longer than 3 seconds, the automatic hydraulic deaeration is activated. During deaeration the system is put in standby mode

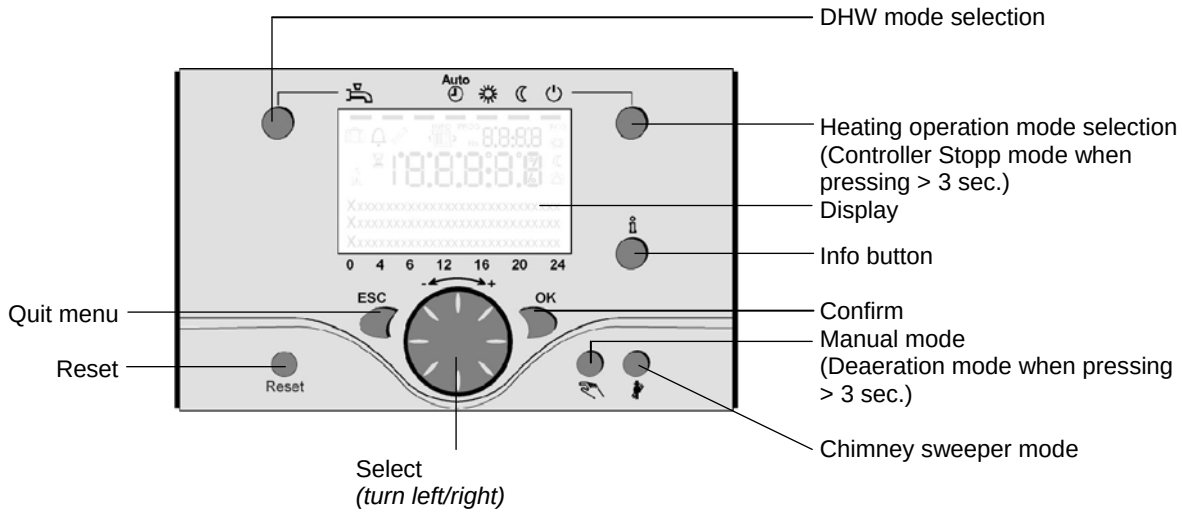
The pumps are switched on and off for several times.
After deaeration, the boiler automatically returns to normal operation.

Chimney sweeper mode (F)
Used for combustion analysis. By pressing the button once again, or automatically after 15 minutes, the chimney sweeper mode will be deactivated (indicated by spanner symbol).

Reset button (H)
By shortly pressing the reset button a burner lockout can be cancelled.

Operating instructions

Display / Programming



Heating to comfort setpoint Info level activated

Heating to reduced setpoint Programming activated

Heating for frost protection setpoint Heating temporarily switched off

Process running – please wait ECO function active

Burner operating (only oil / gas boiler)

Error messages

INFO Info level activated

PROG Programming activated
Heating temporarily switched off

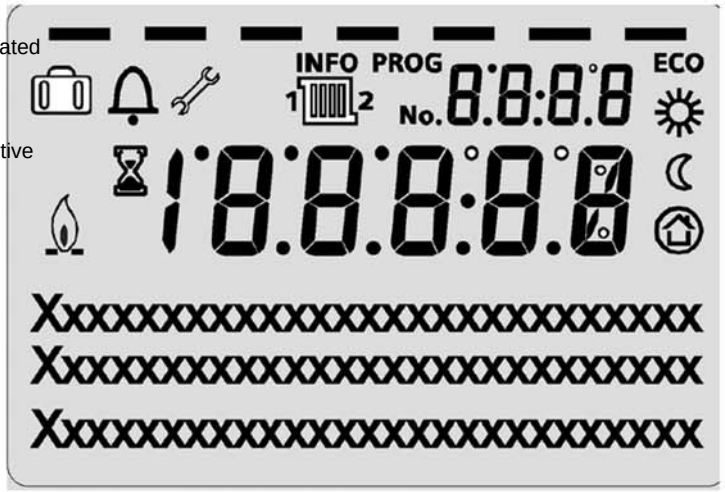
ECO ECO function active

Holiday function active

Reference to heating circuit

Maintenance / special operation

No. Parameter number



Programming

Default mode
(buttons)

Press ***OK*** (1x)

Press ***OK*** (1x)
Press ***INFO*** (4 sec.)

Enduser
- choose menu - confirm with ***OK*** button - choose parameter - confirm with ***OK*** button - change value + - with wheel - confirm with ***OK*** button - return to main menu with ***ESC*** button

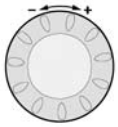
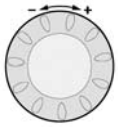
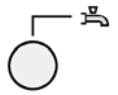
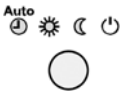
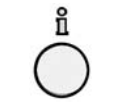
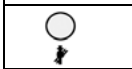
Commissioning	Expert
- choose user level - confirm with ***OK*** button - choose menu - confirm with ***OK*** button - choose parameter - confirm with ***OK*** button - change value + - with wheel - confirm with ***OK*** button - return to main menu with ***ESC*** button	

Operating instructions

OK = confirmation

ESC = cancel, return to main menu

Overview of main functions

Button	Action	Procedure	Display / Function
	Set room temperature	**Zone 1 and zone 2** Actuate wheel left/right Turn wheel Confirm with OK button or wait 5 sec. or press ESC	Comfort setpoint with blinking temperature Blinking temperature in 0,5 °C steps from 10 to 30 °C **Comfort setpoint saved** **Comfort setpoint cancelled** - after 3 sec. Main menu appears
	Set room temperature for zone 1 or zone 2	**Zone 2 independent from zone 1** Actuate wheel left/right Confirm with OK button Actuate wheel left/right Confirm with OK button or wait 5 sec. or press ESC	Choose heating zone Heating zone is chosen Blinking temperature in 0,5 °C steps from 10 to 30 °C **Comfort setpoint saved** **Comfort setpoint cancelled** - after 3 sec. Main menu appears
	Switch on /off DHW operation	Press button	**DHW mode on / off** (see indication below DHW symbol) - On: DHW mode by time programm - Off: no DHW operation - Safety functions activated
	Change heating operation mode	Factory setting Press button 1x Press button 1x again Press button 1x again	**Automatic mode on**, with: - Heating by time program - Temperature setpoint by heating program - Safety functions activated - Summer/Winter automatic switching activated - ECO-functions activated (see indication below operation symbol) **Continuous COMFORT heating on, with:** - Heating without time program by comfort setpoint - Safety functions activated **Continuous REDUCED heating on, with:** - Heating without time program by reduced setpoint - Safety functions activated - Summer/Winter automatic switching activated - ECO-functions activated **Safety mode on**, with: - Heating off - Temperature by frost protection - Safety functions activated
	Controller Stop mode	Press button > 3 sec. Press button > 3 sec. again	**304: Controller Stopp mode** **insert setpoint** after 3 sec. Main menu appears
	Info display	Press button 1x Press button 1x again Press button 1x again ….. Press button 1x	INFO Segment displayed - Status Boiler - room temperature - room temperature minimum - Status DHW - room temperature maximum - Status zone 1 - outside temperature - Status zone 2 - outside temperature minimum - outside temperature maximum - Time / Date - DHW temperature 1 - Error indication - Boiler temperature - Maintenance indication - Flow temperature (Info display depends on configuration) Back to main menu; INFO Segment disappears
	Operation by manual setpoint Change factory setting boiler temperature	Press button 1x Press button i Press button OK Turn wheel -/+ Press button OK Press button ESC Press button	**Manual mode on** (spanner symbol appears) - Heating by fixed setpoint (factory setting = 60 °C) **301: Manual mode** **insert setpoint?** blinking temperature set value **Status boiler** Manual mode off (spanner symbol disappears)
	Deaeration	Press button > 3 sec. Press button > 3 sec. again	312: Deaeration on Deaeration off
	Activate chimney sweeper mode	Press button (< 3 sec.) Press button again (< 3 sec.)	Chimney sweeper mode on Chimney sweeper mode off
	Temporary reduction of reduced temperature on QAA75	Press button Press button again	Heating by reduced setpoint Heating by comfort setpoint
RESET	Reset button	Press button (< 3 sec.) Press button again > 3 sec.	Boiler manually blocked, no release Boiler released, Alarm symbol disappears

Various functions

- **Fixed boiler flow temp with external enable (H5: terminals 111 and 112).**
  1. Set operation mode of the controller (HMI) to comfort mode ☼.
  2. In menu *Configuration* set parameter 5970 (Function input H4) to "Room thermostat HC1".
  3. In menu *Configuration* set parameter 5971 (Contact type H4) "NC".
  4. In menu *Heating circuit 1* set parameter 742 *(*Flow temp setpoint room stat) to the desired flow temperature.

- **Fixed boiler flow temp with time program and external enable (H5: terminals 111 and 112).**
  1. Set operation mode of the controller (HMI) to automatic mode ☼.
  2. In menu *Configuration* set parameter 5970 (Function input H4) to "Room thermostat HC1".
  3. In menu *Configuration* set parameter 5971 (Contact type H4) "NC".
  4. In menu *Heating circuit 1* set parameter 742 *(*Flow temp setpoint room stat) to the desired flow temperature.
  5. In menu *Time program 1* set parameter 500 (Preselection) to the desired selection (Mo-Su, Mo-Fr, Sa-Su, Mo…).
  6. In menu *Time program 1* set parameters 501 - 506 (phase on, phase off) to the desired heating periods.

- **Weathercompensation on boiler flow temp with time program and external enable (H5: terminals 111 and 112).**
  1. Ensure that the resistor on terminals 106 and 107 has been removed and that the outdoor temp sensor (QAC34) has been connected to these terminals.
  2. In menu *Time program 1* set parameter 500 (Preselection) to the desired selection (Mo-Su, Mo-Fr, Sa-Su, Mo…).
  3. In menu *Time program 1* set parameters 501 - 506 (phase on, phase off) to the desired heating periods.
  4. In menu *Heating circuit 1* set parameter 720 (Heating curve slope) and parameter 721 (Heating curve displacement) to the desired values.

- **External temperature setpoint via 0-10Vdc analogue signal (H1: terminals 109 + and 110 -).**
  (Function not active when setpoint < 5°C, Function active when setpoint > 5°C).
  1. Ensure that the analogue 0-10Vdc signal has been connected correctly (polarity).
  2. In menu *Configuration* set parameter 5950 (Function input H1) to "Consumer request VK1 10V".
  3. in menu *Configuration* set the desired curve on parameters 5953 - 5956 (Voltage value 1 for temperature F1 and voltage value 2 for temperature F2). Attention: F1 and F2 units are in 1/10 degrees!!

- **External modulation setpoint via 0-10Vdc analogue signal (H1: terminals 109 + and 110 -).**
  (Function not active when Signal < 0,15Vdc, Function active when signal ≥ 0,2Vdc)
  1. Ensure that the analogue 0-10Vdc signal has been connected correctly (polarity).
  2. In menu *Configuration* set parameter 5950 (Function input H1) to "Preselected output 10V".
  3. In menu *Configuration* set the desired curve on parameters 5953 - 5956 (Voltage value 1 for modulation F1 and voltage value 2 for modulation F2). Attention: F1 and F2 units are in 1/10 percentage burner modulation!!

- **DHW preparation with time program via thermostat/DHW sensor and pump/3-way valve on Relay output QX3.**
  1. Connect the thermostat/DHW sensor (B3, terminals: 104 and 105).
  2. In menu *Configuration* set parameter 5730 (DHW sensor) to "Thermostat" or "DHW sensor B3".
  3. In menu *Domestic hot water* set parameter 1620 (Release) to "Time program 4/DHW".
  4. In menu *Time program 4/DHW* set parameter 560 (Preselection) to desired selection (Mo-Su, Mo-Fr, Sa-Su, Mo…).
  5. In menu *Time program 4/DHW* set parameters 561 - 566 (phase on, phase off) to the desired heating periods.
  6. In menu *Domestic hot water* set parameter 1610 to the desired domestic hot water temperature (max. 65°C).
  7. Activate the DHW mode by pushing the left top button on the control panel.

Maintenance

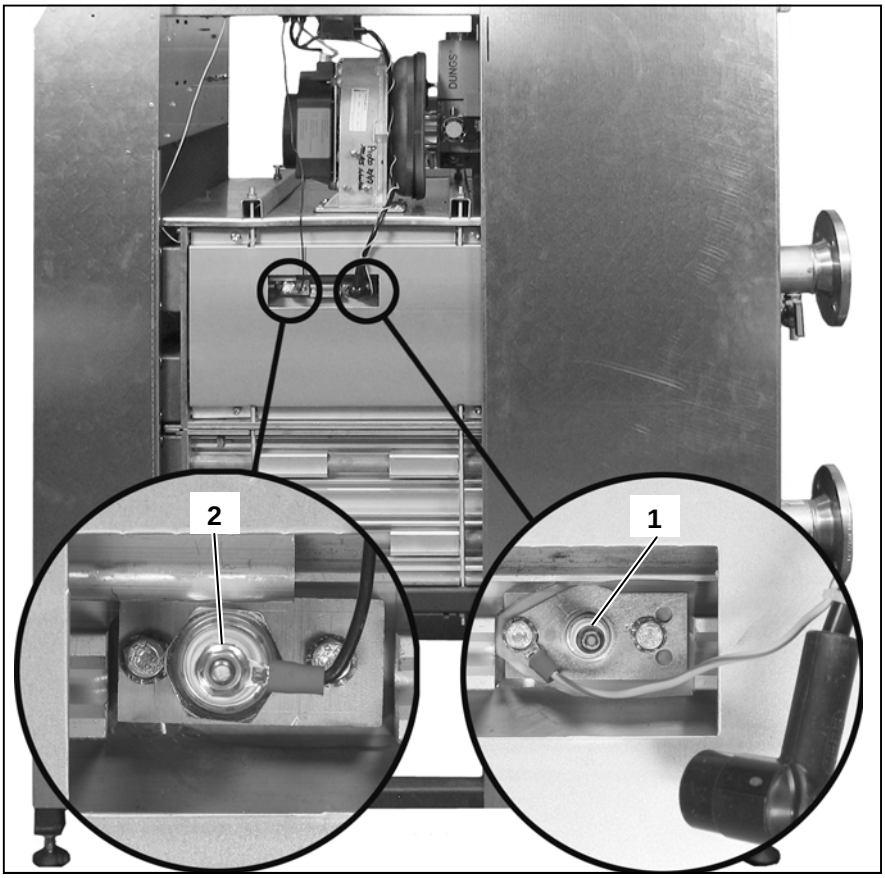
Checklist
Replacing the electrodes

Maintenance of the boiler should be carried out by authorized personnel only.

In order to ensure continued good and safe operation of the boiler, it should be inspected at least once per year. A maintenance protocol should be filled out (see end of this chapter for example of maintenance protocol).

Checklist
The following activities must be carried out, see following paragraphs for an extensive description of the main activities:

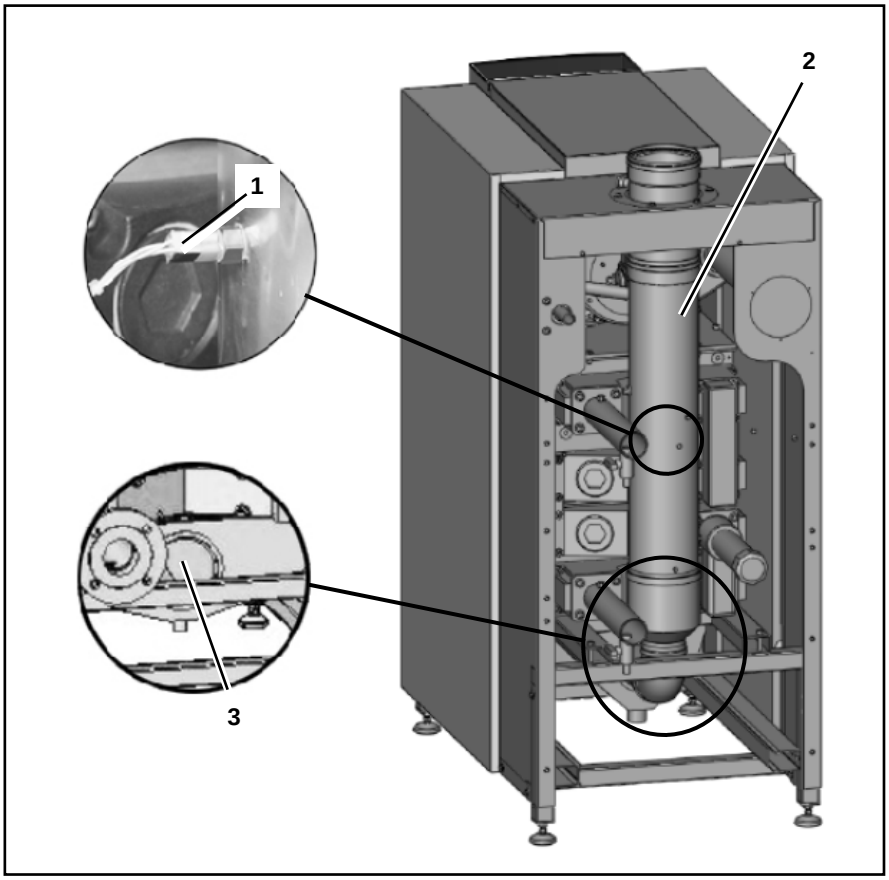
- Replace the ignition and ionisation electrodes;
- Clean the condensate receptacle;
- Clean and refill the syphon;
- Inspect the combustion chamber, clean if necessary;
- Check the water pressure of the system;
- Check the water quality of the system water as well as supply water;
- Check the water flow rate through the boiler;
- Check/correct the combustion values at full and mimimum load with a combustion analyzer;
- Check the gas pressure to the boiler;
- Check the tightness of all sealed connections and test points;
- Check the functionality of all safety devices;
- Fill out a maintenance protocol.



Replacing the electrodes
The electrodes are positioned on the right hand side of the boiler. Replace the ignition electrode (1) and ionisation electrode (2) as shown on the picture.

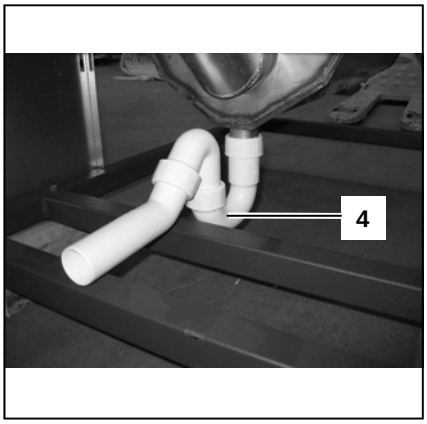
Maintenance

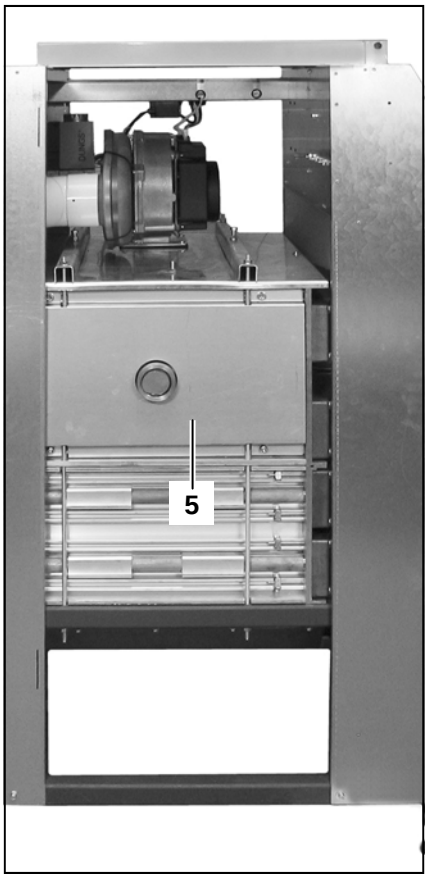
Cleaning the condensate receptacle
Cleaning and refilling the syphon
Inspection of combustion chamber

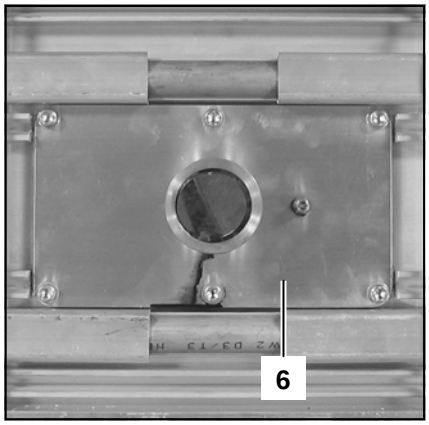


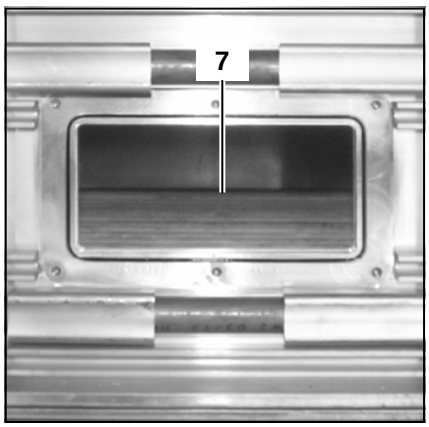
Cleaning the condensate receptacle

- Disconnect the plug of the fluegas temperature sensor (1);
- Remove the internal fluegas pipe (2) of the boiler in order to create access to the condensate receptacle;
- Clean the receptacle (3);
- Mount the fluegas pipe back in position when the cleaning is finished;
- Connect the plug of the fluegas temperature sensor.









Cleaning and refilling the syphon

- Remove the syphon (4) from the condensate connection;
- Clean and fill it with fresh water;
- Mount the syphon back in the original position.

Inspection of combustion chamber

The inspection opening is positioned on the left hand side of the boiler.

- Remove the radiation panel (5) from the heat exchanger;
- Remove the cover (6) from the inspection opening;
- Inspect the combustion chamber (7), clean if necessary;
- Mount the cover and radiation panel back in original position.

Maintenance

Water pressure and quality
Check if the water pressure and quality meet the requirements. Consult the chapter “commissioning: water and hydraulic system” for more detailed information.

Water flow rate
Check if the water flow rate through the boiler is within the limits. Consult the chapter “commissioning: check water flow” for more detailed information.

Combustion analysis
Check the combustion at full load and minumum load, correct the settings if necessary. An additional reference check at 50% load is recommended. Consult the chapter “commissioning: combustion analysis” for more detailed information.

Gas pressure
Check the dynamic pressure of the gas supply to the boiler, when the boiler is running at full load. In case of a boiler cascade, all boilers should be running at full load. See technical data for required values.

Gas tightness check
Check the tightness of all sealed connections with an approved soap or electronic analyzer, for example:

- Test points;
- Bolt connections;
- Gaskets of mixing system, etc.

Safety devices
Check the functionality and the settings of all safety devices connected. Consult the chapter “commissioning: Check functionality of safety devices” for more detailed information.

Maintenance Protocol

Maintenance Protocol R6000			
Project			
Boiler type		Project	
Serial number		Address	
Year		City	
Nominal load (Hi)	[kW]	Date	
Nominal output (Hi)	[kW]	Engineer	
System			
Water pressure	[bar]		
Water pH	[-]		
Water hardness	[dºH]		
Water chloride	[mg/l]		
Water ΔT full load	[ºC]		
Water Δp_{boiler}	[kPa]		
Water flow	[m^3/h]		
Pump setting	[-]		
Safety devices			
High limit setting	[ºC]	Water flow sensor checked	☐
Temp. limiter setting	[ºC]	Fluegas sensor checked	☐
Min. gas pressure switch setting	[mbar]	Water flow switch checked	☐
Ignition time burner	[sec]		

Combustion analysis			
	100% load	**50% load**	**Min. load**
Gas consumption	[m^3/h]	[m^3/h]	[m^3/h]
Gas pressure	[mbar]	[mbar]	[mbar]
CO_2	[%]	[%]	[%]
O_2	[%]	[%]	[%]
CO	[ppm]	[ppm]	[ppm]
NOx	[ppm]	[ppm]	[ppm]
$T_{atmospheric}$	[ºC]	[ºC]	[ºC]
$T_{fluegas}$	[ºC]	[ºC]	[ºC]
$T_{water, flow}$	[ºC]	[ºC]	[ºC]
$T_{water, return}$	[ºC]	[ºC]	[ºC]
Ionisation current	[µA]	[µA]	[µA]
p_{fan}	[mbar]	[mbar]	[mbar]
$p_{top\ panel}$	[mbar]	[mbar]	[mbar]
$p_{combustion\ chamber}$	[mbar]	[mbar]	[mbar]

Remarks

Lockouts

In case of a lockout, a warning symbol ( ) and a flashing error code appears on the display. The cause of a fault should first be determined and eliminated before the boiler is being reset. The table below shows all possible lockouts with indication of possible cause.

Error code	Description of error
0	No error
10	Outside temperature sensor error
20	Boiler temperature 1 sensor error
26	Common flow temperature sensor error
28	Flue gas temperature sensor error
30	Flow temperature 1 sensor error
32	Flow temperature 2 sensor error
38	Flow temperature primary controller sensor error
40	Return temperature 1 sensor error
46	Return temperature cascade sensor error
47	Common return temperature sensor error
50	DHW temperature 1 sensor error
52	DHW temperature 2 sensor error
54	DHW primary controller sensor error
57	DHW circulation temperature sensor error
60	Room temperature 1 sensor error
65	Room temperature 2 sensor error
70	Buffer storage tank temperature 1 sensor error
71	Buffer storage tank temperature 2 sensor error
72	Buffer storage tank temperature 3 sensor error
73	Collector temperature 1 sensor error
74	Collector temperature 2 sensor error
82	LPB address collision
83	BSB wire short-circuit
84	BSB address collision
85	BSB RF communication error
91	EEPROM error lockout information
98	Extension module 1 error (collective error)
99	Extension module 2 error (collective error)
100	2 clocktime masters (LPB)
102	Clocktime master without reserve (LPB)
103	Communication error
105	Maintenance message
109	Boiler temperature supervision
110	STB lockout
111	TW cutout
121	Flow temperature 1 (HC1) supervision
122	Flow temperature 2 (HC2) supervision
125	Pump supervision error
126	DHW charging supervision
127	Legionella temperature not reached
128	Loss of flame during operation
129	Fan error or LP error
130	Flue gas temperature limit exceeded
131	Burner fault
132	GP or LP error
133	No flame during safety time
146	Configuration error collective message

Lockouts

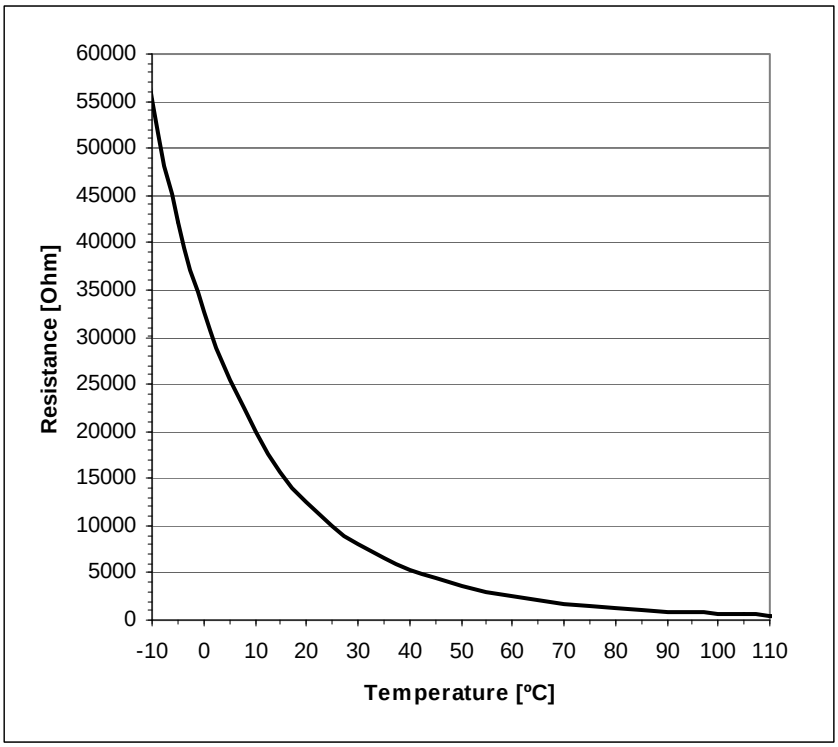
Error code	Description of error
151	Internal error
152	Parameterization error
153	Unit manually locked
160	Fan error
162	LP error, does not close
164	Error heating circuit flow switch
166	LP error, does not open
171	Alarm contact H1 or H4 active
172	Alarm contact H2 (EM1, EM2 or EM3) or H5 active
173	Alarm contact H6 active
174	Alarm contact H3 or H7 active
178	Limit thermostat heating circuit 1
179	Limit thermostat heating circuit 2
183	Unit in parameterization mode
193	Pump supervision error after flame on
216	Fault boiler
217	Fault sensor
241	Flow sensor solar sensor error
242	Return sensor solar sensor error
243	Swimming pool temperature sensor error
270	Limit function
317	Mains frequency outside permissible range
320	DHW charging temperature sensor error
324	BX same sensors
325	BX / extension module same sensors
326	BX / mixing group same sensors
327	Extension module same function
328	Mixing group same finction
329	Extension module / mixing group same function
330	Sensor BX1 no function
331	Sensor BX2 no function
332	Sensor BX3 no function
333	Sensor BX4 no function
334	Sensor BX5 no function
335	Sensor BX21 no function (EM1, EM2 or EM3)
336	Sensor BX22 no function (EM1, EM2 or EM3)
337	Sensor BX1 no function
338	Sensor BX12 no function
339	Collector pump Q5 not available
340	Collector pump Q16 not available
341	Solar Collector sensor B6 not available
342	DHW sensor B31 not available
343	Solar integration not available
344	Solar controlling element buffer K8 not available
345	Solar controlling element swimming pool K18 not available
346	Solid fuel boiler pump Q10 not available
347	Solid fuel boiler comparison sensor not available
348	Solid fuel boiler address error

Lockouts

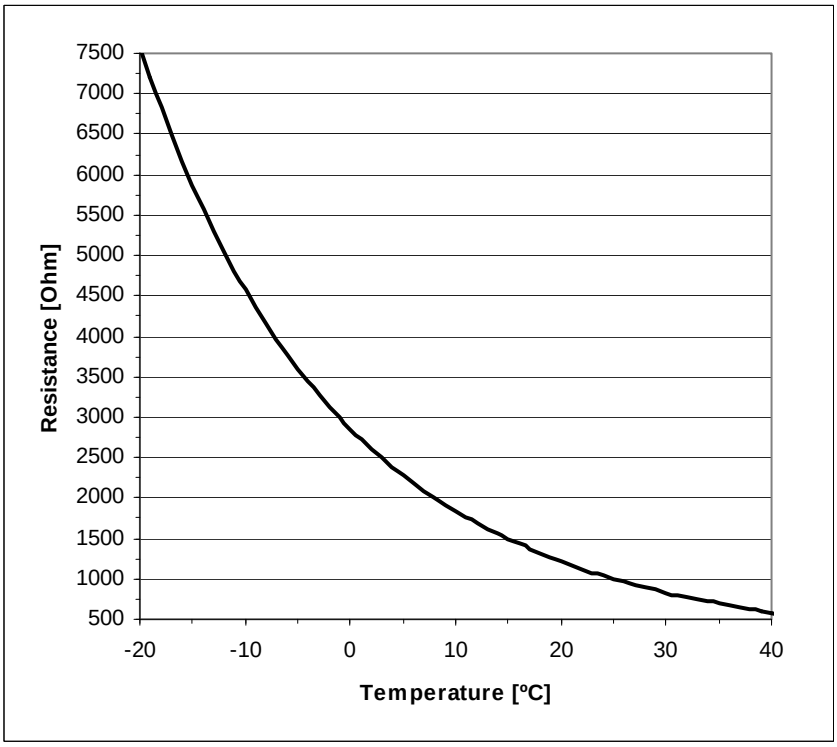
Error code	Description of error
349	Buffer return valve Y15 not available
350	Puffer address sensor
351	Primary controller / system pump address error
352	Pressureless header address error
353	Common flow sensor B10 not available
371	Flow temperature 3 (heating circuit 3) supervision
372	Limit thermostat heating circuit 3
373	Extension module 3 error (collective error)
349	Buffer return valve Y15 not available
350	Puffer address sensor
351	Primary controller / system pump address error
352	Pressureless header address error
353	Common flow sensor B10 not available
371	Flow temperature 3 (heating circuit 3) supervision
372	Limit thermostat heating circuit 3
373	Extension module 3 error (collective error)
386	Fan speed has lost valid range
388	DHW error no function
426	Feedback flue gas damper
427	Configuration flue gas damper
431	Sensor primary heat exchanger
432	Functional earth not connected
433	Temperature primary heat exchanger to high

Sensor values

NTC 10kΩ temperature sensor
(flow, return, flue gas, DHW and header sensor)



NTC 1kΩ temperature sensor
(outdoor sensor)



The diagrams show the sensor values for all boiler sensors and optional sensors available in accessory kits. The diagrams contain average values, as all sensors are liable to tolerances.

When measuring the resistance values, the boiler should always be switched off. Measure close to the sensor, in order to avoid value deviations.

Declaration of Conformity

Rendamax BV, Hamstraat 76, 6465 AG Kerkrade (NL),
Declares that the product

R6000

Is in conformity with the following standards:

EN 298
EN 656
EN 15420
EN 55014-1 / -2
EN 61000-3-2 /-3
EN 60 335-1/ -2

And in accordance with the guidelines of directives:

92 / 42 / EEC (boiler efficiency directive)
2009 / 142 / EEC (gas appliance directive)
73 / 23 / EEC (low voltage directive)
2004 / 108 / EEC (EMC directive)

This product is designated with CE number:

CE – 0063BS3840

Kerkrade, 22-04-2010

ing. G.A.A. Jacobs
Managing Director